

CLAIMS

We claim:

1. A method of modulating gastrointestinal contractility in a mammal in need thereof comprising administering to the mammal a polypeptide, wherein the polypeptide comprises the amino acid sequence of amino acid residues 28 to 108 of SEQ ID NO:2
2. The method according to claim 1, wherein the modulation is inhibition.
3. The method according to claim 1, wherein the polypeptide is administered in one or more administrations.
4. The method according to claim 3, wherein one or more of the administrations of the polypeptide stimulates gastrointestinal contractility, and wherein one or more of the administrations of the polypeptide inhibits gastrointestinal contractility.
5. The method according to claim 4, wherein the one or more administrations that stimulate gastrointestinal contractility are administered before the one or more administrations that inhibit gastrointestinal contractility.
6. The method according to claim 4, wherein the one or more administrations that inhibit gastrointestinal contractility are administered before the one or more administrations that stimulate gastrointestinal contractility.
7. The method according to claim 4, wherein therapeutic control of gastric contractility is achieved.
8. The method according to claim 1, wherein the polypeptide is administered continually for a period of time.
9. A method of stimulating gastrointestinal contractility comprising administering to a mammal in need thereof a polypeptide comprising the amino acid sequence of amino acid residues acids 20 to 105 as shown in SEQ ID NO:5, followed by administering a polypeptide comprising the amino acid sequence of amino acids 28 to 108 of SEQ ID NO:2.

10. A method of modulating gastric emptying in a mammal in need thereof comprising administering to the mammal a polypeptide, wherein the polypeptide comprises the amino acid sequence of amino acid residues 28 to 108 of SEQ ID NO:2 .

11. The method according to claim 10, wherein the modulation is inhibition.

12. The method according to claim 10, wherein the polypeptide is administered in one or more administration.

13. The method according to claim 12, wherein one or more of the administrations of the polypeptide stimulates gastric emptying, and wherein one or more of the administrations of the polypeptide inhibits gastric emptying.

14. The method according to claim 13, wherein the one or more administrations that stimulate gastric emptying are administered before the one or more administrations that inhibit gastric emptying.

15. The method according to claim 13, wherein the one or more administrations that inhibit gastric emptying are administered before the one or more administrations that stimulate gastric emptying.

16. The method according to claim 13, wherein therapeutic control of gastric emptying is achieved.

17. The method according to claim 10, wherein the polypeptide is administered continually for a period of time.

18. A method of modulating intestinal transit in a mammal in need thereof comprising administering to the mammal a polypeptide, wherein the polypeptide comprises the amino acid sequence of amino acid residues 28 to 108 of SEQ ID NO:2.

19. The method according to claim 18, wherein the modulation is inhibition.

20. The method according to claim 19, wherein the polypeptide is administered in one or more administration.

21. The method according to claim 20, wherein one or more of the administrations of the polypeptide stimulates intestinal transit, and wherein one or more of the administrations of the polypeptide are effective in inhibiting intestinal transit.

22. The method according to claim 21, wherein the one or more administrations that stimulate intestinal transit are administered before the one or more administrations that inhibit intestinal transit.

23. The method according to claim 21, wherein the one or more administrations that inhibit intestinal transit are administered before the one or more administrations that stimulate intestinal transit.

24. The method according to claim 21, wherein therapeutic control of intestinal transit is achieved.

25. The method according to claim 18, wherein the polypeptide is administered continually for a period of time.

26. A method of treating gastroparesis in a mammal in thereof comprising, administering to the mammal a polypeptide, wherein the polypeptide comprises the amino acid sequence of amino acid residues 28 to 108 of SEQ ID NO:2, and wherein gastrointestinal contractility, gastric emptying, or intestinal transit is improved.

27. The method according to claim 25, wherein the gastroparesis is related to surgery.

28. The method according to claim 26, wherein the polypeptide is administered to the mammal before or after the surgery.

29. The method according to claim 27, wherein the polypeptide is administered to the mammal before or after the mammal is fed a post-surgery meal.

30. The method according to claim 26, wherein the treatment is characterized by an increase in contractility in the ileus.

31. The method according to claim 26, wherein the gastroparesis is post-operative ileus, or paralytic ileus.

32. The method according to claim 25, wherein the gastroparesis is not related to surgery.

33. The method according to claim 26, wherein the gastroparesis is related to diabetes, intestinal pseudo-obstruction, chronic constipation, dyspepsia, gastroesophageal reflux, emesis, paralytic gastroparesis, sepsis, or consumption of medications.

34. A method of stimulating chemokine release in a mammal in need thereof, comprising administering to the mammal a polypeptide, wherein the polypeptide comprises the amino acid sequence of amino acid residues 28 to 108 of SEQ ID NO:2 or the amino acid sequence of amino acid residues 20 to 105 of SEQ ID NO:5.

35. A method of stimulating neutrophil infiltration in a mammal in need thereof, comprising administering to the mammal a polypeptide, wherein the polypeptide comprises the amino acid sequence of amino acid residues 28 to 108 of SEQ ID NO:2 or the amino acid sequence of amino acid residues 20 to 105 of SEQ ID NO:5.

36. A method of inducing or increasing appetite or weight gain in a mammal in need thereof comprising administering to the mammal a polypeptide, wherein the polypeptide comprises the amino acid sequence of amino acid residues 28 to 108 of SEQ ID NO:2 or the amino acid sequence of amino acid residues 20 to 105 of SEQ ID NO:5.

37. A method of increasing sensitization to a thermal, mechanical or painful stimulus in a mammal in need thereof, comprising administering to the mammal a polypeptide, wherein the polypeptide comprises the amino acid sequence of amino acid residues 28 to 108 of SEQ ID NO:2 or the amino acid sequence of amino acid residues 20 to 105 of SEQ ID NO:5.

38. A method of decreasing sensitization to a thermal, mechanical or painful stimulus in a mammal in need thereof, comprising administering to the mammal an

antagonist to a polypeptide, wherein the polypeptide comprises the amino acid sequence of amino acid residues 28 to 108 of SEQ ID NO:2 or the amino acid sequence of amino acid residues 20 to 105 of SEQ ID NO:5.

39. The method according to claim 38, wherein the antagonist is an antibody that specifically binds to the polypeptide.

40. A method for inducing vasculogenesis in cardiac stem cells, comprising administering a polypeptide, wherein the polypeptide comprises the amino acid sequence of amino acid residues 28 to 108 of SEQ ID NO:2.

41. The method according to claim 40, wherein the vasculogenesis is induced ex vivo or in vitro.

42. A method for inducing angiogenesis in cardiac stem cells, comprising administering a polypeptide, wherein the polypeptide comprises the amino acid sequence of amino acid residues 28 to 108 of SEQ ID NO:2.

43. The method according to claim 42, wherein the neogenesis is induced ex vivo or in vitro.

44. A method of modulating gastrointestinal contractility, gastric emptying or intestinal transit in a mammal in need thereof, comprising administering to the mammal a polypeptide, wherein the polypeptide comprises the amino acid sequence selected from:

- a) amino acid residues 28 to 108 of SEQ ID NO:2
- b) amino acid residues 20 to 105 of SEQ ID NO:5; and
- c) amino acid residues 28 to 129 of SEQ ID NO:29.

45. The method according to claim 44, wherein the polypeptide is administered orally, intraperitoneally, intravenously, intramuscularly, or subcutaneously.

46. A isolated nucleic acid comprising the nucleic acid sequence as shown in SEQ ID NO:14.

47. A method of producing a polypeptide, comprising the step of culturing recombinant host cells that comprise an expression vector, wherein the expression vector comprises the isolated nucleic acid of claim 46, a transcription promoter, and a transcription terminator, wherein the promoter is operably linked with the nucleic acid, and wherein the nucleic acid is operably linked with the transcription terminator, and wherein the protein encoded by the nucleic acid is produced by the recombinant cell.

48. The polypeptide produced by the method of claim 47.